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United States Patent [19][11] **Patent Number:** **6,104,350****Ng et al.**[45] **Date of Patent:** **Aug. 15, 2000**[54] **RETRACTABLE ANGLED ANTENNA ASSEMBLY**

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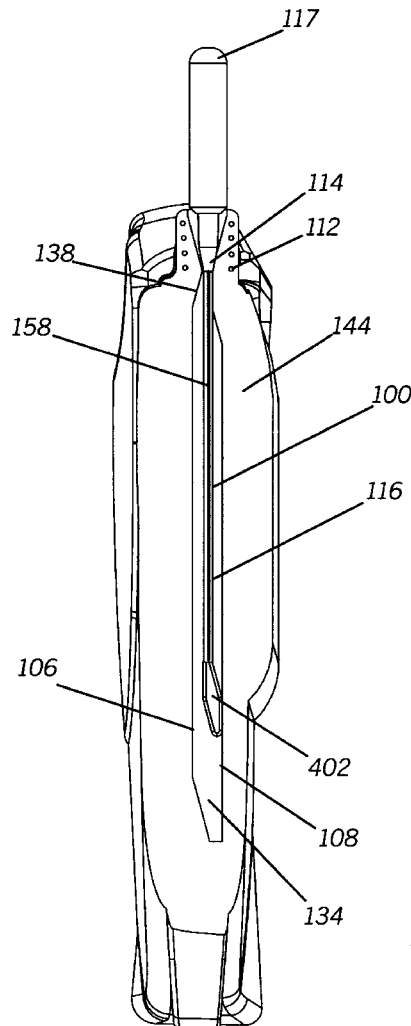
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[73] Assignee: **Motorola, Inc.**, Schaumburg, Ill.[21] Appl. No.: **09/274,040**[57] **ABSTRACT**[22] Filed: **Mar. 22, 1999**

An antenna assembly includes a straw having a substantially linear passageway and a helix base coil with an angled tapered guide, the passageway having a width wider than the widest portion of the angled tapered guide. An antenna element has a stopper portion and a straw. For a vertical retraction and a slanted extension, the antenna element is movable between a slanted position wherein the antenna element is inclined from the housing when the stopper of the antenna element is positioned inside the angled tapered guide of the base coil and a retracted position substantially within the straw inside the radio housing wherein the antenna element is retracted vertically within the straw.

[51] **Int. Cl.⁷** **H01Q 1/24**[52] **U.S. Cl.** **343/702; 343/805; 343/874**[58] **Field of Search** 343/805, 806,
343/807, 874, 888, 889, 901; 455/575,
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19 Claims, 10 Drawing Sheets302